

**IN THE CLAIMS:**

- 1 1. (CURRENTLY AMENDED) A method for operating a node in a computer network,  
2 the node connected to other nodes by links, comprising:
  - 3 determining a path to a destination, the path including one or more links;
  - 4 determining at least one alternate path for having at least some of its one or more  
5 said links differing from the links of the path;
  - 6 reserving resources for said at least one alternate path;
  - 7 subsequent to reserving resources, detecting a link failure on the path; and  
8 rerouting traffic on said at least one alternate path in case of a link failure.
- 1 2. (ORIGINAL) A method as in claim 1, further comprising:  
2 periodically updating said at least one alternate path.
- 1 3. (CURRENTLY AMENDED) A method as in claim 1, further comprising:  
2 determining a plurality of alternate paths for each link the path, and said plurality  
3 of alternate paths do not have any link in common.
- 1 4. (ORIGINAL) A method as in claim 1, further comprising:  
2 rerouting user traffic substantially simultaneously to each link of said at least one  
3 alternate path.
- 1 5. (ORIGINAL) A method as in claim 1, further comprising:

2           reserving resources on said at least one alternate path for switching real-time con-  
3 nections first.

1   6. (CURRENTLY AMENDED) A node in a computer network connected by links, said  
2 node comprising:

3           means for determining a path to a destination, the path including one or more  
4 links;

5           means for determining at least one alternate path ~~for~~ having at least some of its  
6 one or more said links differing from the links of the path;

7           means for reserving resources for said at least one alternate path prior to detecting  
8 a link failure on the path; and

9           means for rerouting traffic on said at least one alternate path in case of a link fail-  
10 ure.

1   7. (ORIGINAL) A node as in claim 6, further comprising:

2           means for periodically updating said at least one alternate path.

1   8. (CURRENTLY AMENDED) A node as in claim 6, further comprising:

2           means for determining a plurality of alternate paths ~~for each link~~ the path, and  
3 said plurality of alternate paths do not have any link in common.

1   9. (ORIGINAL) A node as in claim 6, further comprising:

2           means for rerouting user traffic substantially simultaneously to each link of said at  
3 least one alternate path.

1     10. (ORIGINAL) A node as in claim 6, further comprising:

2             means for reserving resources on said at least one alternate path for switching  
3     real-time connections first.

1     11. (CURRENTLY AMENDED) A node in a computer network connected by links, said  
2     node comprising:

3             a transit connection manager (TCM) adapted to

4                     set up transit connections for a path,

5                     update routing tables,

6                     route traffic; and

7             an alternate path manager adapted to

8                     determine at least one alternate path for use in case of failure of a each-  
9             link of the path,

10                     allocate connections on said at least one alternate path prior to a link fail-  
11     ure on the path,

12                     reserve resources on said at least one alternate path prior to a link failure  
13     on     the path,

14                     request to said TCM the rerouting of traffic on said at least one alternate  
15     path in case of a link failure.

1     12. (CURRENTLY AMENDED) The node according to claim 11, further comprising:

2             ~~for each outbound trunk~~, said at least one ~~pre-selected~~ alternate path is a plurality  
3     of alternate paths that each include one or more links and the plurality of alternate paths  
4     do not have any link in common.

1    13. (CURRENTLY AMENDED) The node according to claim 11, further comprising:  
2           said alternate path manager adapted to reroute ~~said~~-user traffic to each link of said  
3    at least one alternate path.

1    14. (ORIGINAL) The node according to claim 11, further comprising:  
2           said alternate path manager adapted to reserve resources on said at least one alter-  
3    nate path for making real-time connections first.

1    15. (CURRENTLY AMENDED) A node in a computer network connected by links, said  
2    node comprising:  
3           a transit connection manager (TCM) adapted to  
4                set up transit connections for a path,  
5                update routing tables,  
6                route traffic; and  
7           an alternate path manager adapted to  
8                determine at least one alternate path for use in case of failure of a each  
9           link of the path,  
10           allocate connections on said at least one alternate path prior to a link fail-  
11   ure on the path,  
12           reserve resources on said at least one alternate path prior to a link failure  
13   on the path,  
14           request to said TCM the rerouting of traffic on said at least one alternate  
15    path in case of a the link failure,

16                   periodically re-determine at least one alternate path for ~~each link~~ the path  
17                   in response to user traffic, network resources, and quality of service changes.

1    16. (ORIGINAL) The node according to claim 15 further comprising:

2                   said alternate path manager adapted to periodically update said re-determined at  
3    least one alternate path after a predetermined period of time.

1    17. (CURRENTLY AMENDED) A method of non-disruptive packet switching in a net-  
2    work having nodes interconnected with transmission trunks, said method comprising:

3                   pre-selecting at least on alternate path for each trunk;

4                   reserving connections at each node to make said at least one alternate path;

5                   reserving bandwidth resources to transmit packets on said at least one alternate  
6    path;

7                   subsequent to the reserving connections and reserving resources, detecting a fail-  
8    ure of a particular trunk; and

9                   switching the path of a packet from ~~a~~ said particular trunk, in response to failure  
10   of said particular trunk, to said at least one alternate path.

1    18. (CURRENTLY AMENDED) The method according to claim 17 further comprising:

2                   ~~for each outbound trunk,~~ said at least one pre-selected alternate path is a plurality  
3    of alternate paths that each include one or more trunks, and the plurality of paths do not  
4    have any trunk in common.

1    19. (CURRENTLY AMENDED) The method according to claim 17 further comprising:

2 rerouting ~~said~~ user traffic to each trunk of said at least one alternate path.

1 20. (ORIGINAL) The method according to claim 17 further comprising:

2 reserving resources said at least one alternate path for making a real-time connec-  
3 tion first.

1 21. (CURRENTLY AMENDED) A method of non-disruptive packet switching in a net-  
2 work having nodes interconnected with transmission trunks, said method comprising:

3 pre-selecting at least on alternate path for each trunk;

4 reserving connections at each node to make said at least one alternate path;

5 reserving bandwidth resources to transmit packets on said at least one alternate  
6 path;

7 subsequent to the reserving connections and reserving resources, detecting a fail-  
8 ure of a particular trunk;

9 switching the path of a packet from a said particular trunk, in response to failure  
10 of said particular trunk, to said at least one alternate path; and

11 re-selecting at least one new alternate path for each trunk in response to user traf-  
12 fic, network resources, and quality of service changes.

1 22. (ORIGINAL) The method according to claim 21 further comprising:

2 periodically updating said re-selected at least one new pre-selected alternate path  
3 after a predetermined period of time.

1 23. (CURRENTLY AMENDED) A packet switching computer network comprising:

2 a plurality of nodes interconnected by links, said nodes having  
3 a transit connection manager (TCM) adapted to  
4 set up transit connections,  
5 update routing tables,  
6 route traffic; and  
7 an alternate path manager adapted to  
8 determine at least one alternate path for each link,  
9 allocate connections on said at least one alternate path prior to a  
10 link failure,  
11 reserve resources on said at least one alternate path prior to a link  
12 failure,  
13 request to said TCM the rerouting of traffic on said at least one alternate path in case of a  
14 link failure.

1 24. (CURRENTLY AMENDED) The network according to claim 23 further comprising:  
2 for each outbound trunk, said at least one pre-selected alternate path is a plurality  
3 of alternate paths that each include one or more trunks, and the plurality of alternate paths  
4 do not have any trunk in common.

1 25. (CURRENTLY AMENDED) The network according to claim 23, further comprising:  
2 said alternate path manager adapted to reroute ~~said~~-user traffic to each trunk of  
3 said at least one alternate path.

1 26. (ORIGINAL) The network according to claim 23 further comprising:

2           said alternate path manager adapted to reserve resources on said at least one alter-  
3   nate path for real-time connections first.

1   27. (CURRENTLY AMENDED) A packet switching computer network comprising:

2           a plurality of nodes interconnected by links, said nodes having

3                   a transit connection manager (TCM) adapted to

4                           set up transit connections,

5                           update routing tables,

6                           route traffic; and

7                   an alternate path manager adapted to

8                           determine at least one alternate path for each link,

9                           allocate connections on said at least one alternate path prior to a

10   link failure,

11                           reserve resources on said at least one alternate path prior to a link

12   failure,

13                           request to said TCM the rerouting of traffic on said at least one al-

14                                   ternate path in case of a link failure,

15                           periodically re-determine at least one alternate path for each link in

16                                   response to user traffic, network resources, and quality of

17                                   service changes.

1   28. (ORIGINAL) The network according to claim 27 further comprising:

2           said alternate path manager adapted to periodically update said re-determined at

3   least one alternate path after a predetermined period of time.



1   29. (CURRENTLY AMENDED) A method in a node of a packet switching communica-  
2   tion network having a plurality of access (~~202..205~~) and transit nodes (~~201..208~~) inter-  
3   connected with transmission trunks (~~209~~), for, in case of failure or unavailability of an  
4   outbound trunk (~~800~~), rerouting user traffic to an alternate path (~~805, 806~~), said method  
5   comprising:

6           searching, pre-selecting, and storing at least one alternate path (~~805, 806~~) between  
7   origin node (~~803~~) and destination node (~~804~~) ~~of~~ for each outbound trunk (~~800~~), said  
8   searching, pre-selecting and storing done in response to existing user traffic, network re-  
9   sources, and requested quality of service;

10           pre-allocating connections to said at least one alternate path;

11           reserving resources on said at least one alternate path prior to failure or unavail-  
12   ability of an outbound trunk;

13   \_\_\_\_\_ and, in case of failure or unavailability of an outbound trunk, the further steps of:

14           activating said at least one alternate path; and

15           rerouting the user traffic on said activated at least one alternate path.

1   30. (ORIGINAL) The method according to claim 29 further comprising:

2           updating said stored at least one pre-selected alternate path in response to user  
3   traffic, network resources, and quality of service changes.

1   31. (ORIGINAL) The method according to claim 29 further comprising:

2           periodically updating said stored at least one pre-selected alternate path after a  
3   predetermined period of time.

1   32. (ORIGINAL) The method according to claim 29, further comprising:

2           for each outbound trunk, said at least one pre-selected alternate path is a plurality  
3 of alternate paths and the plurality of paths do not have any trunk in common.

1   33. (ORIGINAL) The method according to claim 29 further comprising:

2           transmitting said user traffic over the network in at least one end-to-end connec-  
3 tion established between access nodes.

1   34. (ORIGINAL) The method according to claim 29 further comprising:

2           rerouting said user traffic to each trunk of said at least one alternate path.

1   35. (ORIGINAL) The method according to claim 29 further comprising:

2           reserving resources on said at least one alternate path for real-time connections  
3 first.

1   36-40. (CANCELLED)

1   41. (NEW) The method as in claim 1, wherein the resources include bandwidth for pass-  
2 ing traffic, and reserving resources for said at least one alternate path further comprises:

3           sending a message to one or more nodes associated with the alternate path, the  
4 message to request the one or more nodes to reserve bandwidth for use by the alternate  
5 path.

1   42. (NEW) The method as in claim 1, further comprising:

2           sending one or more set-up request messages to one or more nodes associated  
3           with each of the one or more alternate paths, to allocate a connection along each of the  
4           one or more alternate paths;

5           maintaining the connection along each of the one or more alternate paths in a  
6           standby mode; and

7           in response to a link failure on the path, activating the connection along at least  
8           one of the one or more alternate paths.

1    43. (NEW) The node as in claim 11, wherein the resources include bandwidth for pass-  
2    ing traffic, and the TCM reserves resources for said at least one alternate path with a mes-  
3    sage to one or more nodes associated with the alternate path, the message to request the  
4    one or more nodes to reserve bandwidth for use by the alternate path.

1    44. (NEW) The node as in claim 11, wherein the TCM is configured to allocate connec-  
2    tions by transmission of one or more set-up request messages to one or more nodes asso-  
3    ciated with each of the one or more alternate paths, to maintain a connection along each  
4    of the one or more alternate paths in a standby mode, and to activate the connection along  
5    at least one of the one or more alternate paths in response to a link failure.